

Aloha Petroleum - Barber's Point Sales Terminal
Summary of Facility Emissions

Current Emissions

	BT-101	BT-102	BT-103	BT-201	BT-202	BT-203	BT-204	BT-205	BT-301	Loadrack	Fugitives	TOTAL
VOC (TPY)	5.5	5.5	5.5	4.9	5.7	8.5	8.5	5.5	3.2	4.2	0.3	57
HAPs (TPY)	0.2	0.2	0.2	0.2	0.3	0.4	0.4	0.2	0.1	0.1	0.0	2

Modification - Appl. 0220-08 - Throughput Increase

	BT-101	BT-102	BT-103	BT-201	BT-202	BT-203	BT-204	BT-205	BT-301	Loadrack	Fugitives	TOTAL
VOC (TPY)	5.5	5.5	5.5	4.9	5.7	8.5	8.5	5.5	3.2	7.6	0.3	61
HAPs (TPY)	0.2	0.2	0.2	0.2	0.3	0.4	0.4	0.2	0.1	0.1	0.0	2

Modification - Appl. 0220-08 - Throughput Increase

181,000,000 gallons through one tank

	BT-101	BT-102	BT-103	BT-201	BT-202	BT-203	BT-204	BT-205	BT-301	Loadrack	Fugitives	TOTAL
VOC (TPY)	5.7	5.7	5.7	5.1	5.9	8.7	8.7	5.7	3.6	7.6	0.3	63
HAPs (TPY)	0.3	0.3	0.3	0.2	0.3	0.4	0.4	0.3	0.2	0.1	0.0	3

FLOATING ROOF TANKS

TANK ID NO. BT-101

Modification - Appl. 0220-08 - Throughput Increase

ROOF TYPE (INTERNAL, EXTERNAL) = INTERNAL

CAPACITY (bbl)= **50,000** CAPACITY (gal)= 2,100,000
 TANK DIAMETER (ft)= **79** FUEL TYPE= **UNLEADED PREM**
 TANK HEIGHT (ft)= **60** VMW (lb/lb-mole)= **64**
 LIQUID HEIGHT (ft)= 57.27 DISTILLATION SLOPE= **3**
 THROUGHPUT (bbl/yr)= 317,500 RVP= **11.500**
 TURNSOVERS= **6.35**

PAINT ABSORPTANCE= **0.170**
 INSULATION FACTOR= **1.639**
 AVG. WIND SPEED (TABLE 7.1-9, PG. 7.1-74)= **11.40**

$$L_T = L_R + L_{WD} + L_F + L_D = \mathbf{10,908 \text{ lbs}}$$

$$L_R = \text{rim seal loss} = (K_{Ra} - K_{Rb}v^n)DP \cdot M_v K_C = 6417$$

$$K_{Ra} \text{ (table 7.1-8, pg. 7.1-73)} = \mathbf{5.8}$$

$$K_{Rb} \text{ (table 7.1-8, pg. 7.1-73)} = \mathbf{0.3}$$

$$n \text{ (table 7.1-8, pg. 7.1-73)} = \mathbf{2.1}$$

$$v \text{ (note 1, pg. 7.1-21)} = 0$$

$$P^* \text{ (vapor pres. function)} = 0.219$$

$$K_C \text{ (page 7.1-21)} = 1.00$$

$$L_{WD} = \text{withdrawal loss} = \{(0.943QCW_L)/D\}[1 + (N_C F_C/D)] = 32$$

$$C \text{ (table 7.1-10, pg. 7.1-78)} = \mathbf{0.0015}$$

$$W_L \text{ (tables 7.1-2 \& 3, pg. 7.1-53)} = \mathbf{5.60}$$

$$N_C \text{ (note 2, pg. 7.1-22)} = \mathbf{1}$$

$$F_C \text{ (note 3, pg. 7.1-21)} = \mathbf{1}$$

$$L_F = \text{deck fitting loss} = F_F P^* M_v K_C = 4459$$

$$F_F \text{ (table 7.1-12)} = 318.39$$

$$L_D = \text{deck seam loss} = K_D S_D D^2 P^* M_v K_C = 0$$

$$K_D \text{ (0 for welded, else 0.14 pg. 7.1-24)} = \mathbf{0.00}$$

$$\text{Total length of deck seam (ft)} = \mathbf{150}$$

$$S_D \text{ (pg. 7.1-25)} = 0.000$$

$$L_T = \mathbf{5.5 \text{ T/yr}}$$

HAPS	CAS #	VAPOR WEIGHT	EMISSIONS
		FACTOR	(lb/yr)
BENZENE	71432	0.0104	113.44
HEXANE	110543	0.0037	40.36
o-XYLENE	101414	0.0013	14.18
ETHYLBENZENE	95476	0.0013	14.18
p-XYLENE	106423	0.0016	17.45
m-XYLENE	108383	0.0046	50.18
TOLUENE	108883	0.0213	232.34
CUMENE	98828	0.0000	0.00

TOTAL HAPs (lb/yr) 482.1

TOTAL HAPs (TPY) 0.24

P_{VA}= 8.661
 T_{LA}= 539.162

A= 11.7
 B= 5,134
 T_{AA}= 536.95
 T_B= 536.97

DECK FITTING LOSS	QTY	K _F
<u>Access hatch (24" dia)</u>		
bolted cover, gasket		0.00
unbolted cover, gasket		0.00
unbolted cover, no gasket	1	36.00
<u>Fixed roof support column well</u>		
Round pipe, ungasketed sliding cover		0.00
Round pipe, gasketed sliding cover		0.00
Round pipe, flex fabric sleeve seal	1	10.00
Built-up col., ungasketed sliding cover		0.00
Built-up col., gasketed sliding cover		0.00
<u>Unslotted guide-pole and well</u>		
Ungasketed sliding cover		0.00
Ungasketed sliding cover w/ pole sleeve		0.00
Gasketed sliding cover		0.00
Gasketed sliding cover w/pole wiper		0.00
Gasketed sliding cover w/pole sleeve		0.00
<u>Slotted guide-pole/sample well</u>		
Ungasketed or gasketed sliding cover		0.00
Ungasketed or gasketed sliding cover w/float		0.00
Gasketed sliding cover w/pole wiper		0.00
Gasketed sliding cover w/pole sleeve		0.00
Gasketed sliding cover w/float & pole wiper		0.00
Gasketed sliding cover w/float, wiper & sleeve		0.00
<u>Automatic gauge float well</u>		
unbolted cover, ungasketed	1	14.00
unbolted cover, gasket		0.00
bolted cover, gasket		0.00

DECK FITTING LOSS	QTY	K _F
<u>Gauge-hatch/sample port</u>		
Weighted mechanical, gasket		0.00
Weighted mechanical, ungasket		0.00
Slit fabric seal, 10% open area	1	12.00
<u>Vacuum breaker</u>		
Weighted mechanical, ungasketed		0.00
Weighted mechanical, gasketed		0.00
<u>Deck drain (3" dia.)</u>		
Open		0.00
90% closed		0.00
<u>Stub drain</u>	29	34.56
<u>Deck leg</u>		
Adjustable, internal floating	17	134.30
Adjustable, pontoon area, ungasketed		0.00
Adjustable, pontoon area, gasketed		0.00
Adjustable, pontoon area, sock		0.00
Adjustable, center area, ungasketed	1	0.82
Adjustable, center area, gasketed		0.00
Adjustable, center area, sock		0.00
Adjustable, double deck roofs		0.00
<u>Rim vent</u>		
Weighted mechanical, ungasketed		0.00
Weighted mechanical, gasketed	1	0.71
<u>Ladder well</u>		
Sliding cover, ungasketed	1	76.00
Sliding cover, gasketed		0.00
TOTAL		318.39

FLOATING ROOF TANKS

TANK ID NO. BT-102

Modification - Appl. 0220-08 - Throughput Increase

ROOF TYPE (INTERNAL, EXTERNAL) = INTERNAL

CAPACITY (bbl)= **50,000** CAPACITY (gal)= 2,100,000
 TANK DIAMETER (ft)= **79** FUEL TYPE= **UNLEADED PREM**
 TANK HEIGHT (ft)= **60** VMW (lb/lb-mole)= **64**
 LIQUID HEIGHT (ft)= 57.27 DISTILLATION SLOPE= **3**
 THROUGHPUT (bbl/yr)= 317,500 RVP= **11.500**
 TURNOVERS= **6.35**

PAINT ABSORPTANCE= **0.170**
 INSULATION FACTOR= **1.639**
 AVG. WIND SPEED (TABLE 7.1-9, PG. 7.1-74)= **11.40**

$$L_T = L_R + L_{WD} + L_F + L_D = \mathbf{10,908 \text{ lbs}}$$

$$L_R = \text{rim seal loss} = (K_{Ra} - K_{Rb}v^n)DP \cdot M_v K_C = 6417$$

$$K_{Ra} \text{ (table 7.1-8, pg. 7.1-73)} = \mathbf{5.8}$$

$$K_{Rb} \text{ (table 7.1-8, pg. 7.1-73)} = \mathbf{0.3}$$

$$n \text{ (table 7.1-8, pg. 7.1-73)} = \mathbf{2.1}$$

$$v \text{ (note 1, pg. 7.1-21)} = 0$$

$$P^* \text{ (vapor pres. function)} = 0.219$$

$$K_C \text{ (page 7.1-21)} = 1.00$$

$$L_{WD} = \text{withdrawal loss} = \{(0.943QCW_L)/D\}[1 + (N_C F_C/D)] = 32$$

$$C \text{ (table 7.1-10, pg. 7.1-78)} = \mathbf{0.0015}$$

$$W_L \text{ (tables 7.1-2 \& 3, pg. 7.1-53)} = \mathbf{5.60}$$

$$N_C \text{ (note 2, pg. 7.1-22)} = \mathbf{1}$$

$$F_C \text{ (note 3, pg. 7.1-21)} = \mathbf{1}$$

$$L_F = \text{deck fitting loss} = F_F P^* M_v K_C = 4459$$

$$F_F \text{ (table 7.1-12)} = 318.39$$

$$L_D = \text{deck seam loss} = K_D S_D D^2 P^* M_v K_C = 0$$

$$K_D \text{ (0 for welded, else 0.14 pg. 7.1-24)} = \mathbf{0.00}$$

$$\text{Total length of deck seam (ft)} = \mathbf{150}$$

$$S_D \text{ (pg. 7.1-25)} = 0.000$$

$$L_T = \mathbf{5.5 \text{ T/yr}}$$

HAPS	CAS #	VAPOR WEIGHT	EMISSIONS
		FACTOR	(lb/yr)
BENZENE	71432	0.0104	113.44
HEXANE	110543	0.0037	40.36
o-XYLENE	101414	0.0013	14.18
ETHYLBENZENE	95476	0.0013	14.18
p-XYLENE	106423	0.0016	17.45
m-XYLENE	108383	0.0046	50.18
TOLUENE	108883	0.0213	232.34
CUMENE	98828	0.0000	0.00

TOTAL HAPs (lb/yr) 482.1

TOTAL HAPs (TPY) 0.24

P_{VA}= 8.661
 T_{LA}= 539.162

A= 11.7
 B= 5,134
 T_{AA}= 536.95
 T_B= 536.97

DECK FITTING LOSS	QTY	K _F
<u>Access hatch (24" dia)</u>		
bolted cover, gasket		0.00
unbolted cover, gasket		0.00
unbolted cover, no gasket	1	36.00
<u>Fixed roof support column well</u>		
Round pipe, ungasketed sliding cover		0.00
Round pipe, gasketed sliding cover		0.00
Round pipe, flex fabric sleeve seal	1	10.00
Built-up col., ungasketed sliding cover		0.00
Built-up col., gasketed sliding cover		0.00
<u>Unslotted guide-pole and well</u>		
Ungasketed sliding cover		0.00
Ungasketed sliding cover w/ pole sleeve		0.00
Gasketed sliding cover		0.00
Gasketed sliding cover w/pole wiper		0.00
Gasketed sliding cover w/pole sleeve		0.00
<u>Slotted guide-pole/sample well</u>		
Ungasketed or gasketed sliding cover		0.00
Ungasketed or gasketed sliding cover w/float		0.00
Gasketed sliding cover w/pole wiper		0.00
Gasketed sliding cover w/pole sleeve		0.00
Gasketed sliding cover w/float & pole wiper		0.00
Gasketed sliding cover w/float, wiper & sleeve		0.00
<u>Automatic gauge float well</u>		
unbolted cover, ungasketed	1	14.00
unbolted cover, gasket		0.00
bolted cover, gasket		0.00

DECK FITTING LOSS	QTY	K _F
<u>Gauge-hatch/sample port</u>		
Weighted mechanical, gasket		0.00
Weighted mechanical, ungasket		0.00
Slit fabric seal, 10% open area	1	12.00
<u>Vacuum breaker</u>		
Weighted mechanical, ungasketed		0.00
Weighted mechanical, gasketed		0.00
<u>Deck drain (3" dia.)</u>		
Open		0.00
90% closed		0.00
<u>Stub drain</u>	29	34.56
<u>Deck leg</u>		
Adjustable, internal floating	17	134.30
Adjustable, pontoon area, ungasketed		0.00
Adjustable, pontoon area, gasketed		0.00
Adjustable, pontoon area, sock		0.00
Adjustable, center area, ungasketed	1	0.82
Adjustable, center area, gasketed		0.00
Adjustable, center area, sock		0.00
Adjustable, double deck roofs		0.00
<u>Rim vent</u>		
Weighted mechanical, ungasketed		0.00
Weighted mechanical, gasketed	1	0.71
<u>Ladder well</u>		
Sliding cover, ungasketed	1	76.00
Sliding cover, gasketed		0.00
TOTAL		318.39

FLOATING ROOF TANKS

TANK ID NO. BT-103

Modification - Appl. 0220-08 - Throughput Increase

ROOF TYPE (INTERNAL, EXTERNAL) = INTERNAL

CAPACITY (bbl)= **50,000** CAPACITY (gal)= 2,100,000
 TANK DIAMETER (ft)= **79** FUEL TYPE= **UNLEADED PREM**
 TANK HEIGHT (ft)= **60** VMW (lb/lb-mole)= **64**
 LIQUID HEIGHT (ft)= 57.27 DISTILLATION SLOPE= **3**
 THROUGHPUT (bbl/yr)= 317,500 RVP= **11.500**
 TURNOVERS= **6.35**

PAINT ABSORPTANCE= **0.170**
 INSULATION FACTOR= **1.639**
 AVG. WIND SPEED (TABLE 7.1-9, PG. 7.1-74) **11.40**

$$L_T = L_R + L_{WD} + L_F + L_D = \mathbf{10,908 \text{ lbs}}$$

$$L_R = \text{rim seal loss} = (K_{Ra} - K_{Rb} v^n) DP * M_v K_C = 6417$$

$$K_{Ra} \text{ (table 7.1-8, pg. 7.1-73)} = \mathbf{5.8}$$

$$K_{Rb} \text{ (table 7.1-8, pg. 7.1-73)} = \mathbf{0.3}$$

$$n \text{ (table 7.1-8, pg. 7.1-73)} = \mathbf{2.1}$$

$$v \text{ (note 1, pg. 7.1-21)} = 0$$

$$P^* \text{ (vapor pres. function)} = 0.219$$

$$K_C \text{ (page 7.1-21)} = 1.00$$

$$L_{WD} = \text{withdrawal loss} = \{(0.943 QCW_L)/D\} [1 + (N_C F_C/D)] = 32$$

$$C \text{ (table 7.1-10, pg. 7.1-78)} = \mathbf{0.0015}$$

$$W_L \text{ (tables 7.1-2 \& 3, pg. 7.1-53)} = \mathbf{5.60}$$

$$N_C \text{ (note 2, pg. 7.1-22)} = \mathbf{1}$$

$$F_C \text{ (note 3, pg. 7.1-21)} = \mathbf{1}$$

$$L_F = \text{deck fitting loss} = F_F P^* M_v K_C = 4459$$

$$F_F \text{ (table 7.1-12)} = 318.39$$

$$L_D = \text{deck seam loss} = K_D S_D D^2 P^* M_v K_C = 0$$

$$K_D \text{ (0 for welded, else 0.14 pg. 7.1-24)} = \mathbf{0.00}$$

$$\text{Total length of deck seam (ft)} = \mathbf{150}$$

$$S_D \text{ (pg. 7.1-25)} = 0.000$$

$$L_T = \mathbf{5.5 \text{ T/yr}}$$

HAPS	CAS #	VAPOR WEIGHT	EMISSIONS
		FACTOR	(lb/yr)
BENZENE	71432	0.0104	113.44
HEXANE	110543	0.0037	40.36
o-XYLENE	101414	0.0013	14.18
ETHYLBENZENE	95476	0.0013	14.18
p-XYLENE	106423	0.0016	17.45
m-XYLENE	108383	0.0046	50.18
TOLUENE	108883	0.0213	232.34
CUMENE	98828	0.0000	0.00

TOTAL HAPs (lb/yr) 482.1

TOTAL HAPs (TPY) 0.24

A= 11.7
 B= 5,134
 P_{VA}= 8.661
 T_{LA}= 539.162
 T_{AA}= 536.95
 T_B= 536.97

DECK FITTING LOSS	QTY	K _F
<u>Access hatch (24" dia)</u>		
bolted cover, gasket		0.00
unbolted cover, gasket		0.00
unbolted cover, no gasket	1	36.00
<u>Fixed roof support column well</u>		
Round pipe, ungasketed sliding cover		0.00
Round pipe, gasketed sliding cover		0.00
Round pipe, flex fabric sleeve seal	1	10.00
Built-up col., ungasketed sliding cover		0.00
Built-up col., gasketed sliding cover		0.00
<u>Unslotted guide-pole and well</u>		
Ungasketed sliding cover		0.00
Ungasketed sliding cover w/ pole sleeve		0.00
Gasketed sliding cover		0.00
Gasketed sliding cover w/pole wiper		0.00
Gasketed sliding cover w/pole sleeve		0.00
<u>Slotted guide-pole/sample well</u>		
Ungasketed or gasketed sliding cover		0.00
Ungasketed or gasketed sliding cover w/float		0.00
Gasketed sliding cover w/pole wiper		0.00
Gasketed sliding cover w/pole sleeve		0.00
Gasketed sliding cover w/float & pole wiper		0.00
Gasketed sliding cover w/float, wiper & sleeve		0.00
<u>Automatic gauge float well</u>		
unbolted cover, ungasketed	1	14.00
unbolted cover, gasket		0.00
bolted cover, gasket		0.00

DECK FITTING LOSS	QTY	K _F
<u>Gauge-hatch/sample port</u>		
Weighted mechanical, gasket		0.00
Weighted mechanical, ungasket		0.00
Slit fabric seal, 10% open area	1	12.00
<u>Vacuum breaker</u>		
Weighted mechanical, ungasketed		0.00
Weighted mechanical, gasketed		0.00
<u>Deck drain (3" dia.)</u>		
Open		0.00
90% closed		0.00
<u>Stub drain</u>	29	34.56
<u>Deck leg</u>		
Adjustable, internal floating	17	134.30
Adjustable, pontoon area, ungasketed		0.00
Adjustable, pontoon area, gasketed		0.00
Adjustable, pontoon area, sock		0.00
Adjustable, center area, ungasketed	1	0.82
Adjustable, center area, gasketed		0.00
Adjustable, center area, sock		0.00
Adjustable, double deck roofs		0.00
<u>Rim vent</u>		
Weighted mechanical, ungasketed		0.00
Weighted mechanical, gasketed	1	0.71
<u>Ladder well</u>		
Sliding cover, ungasketed	1	76.00
Sliding cover, gasketed		0.00

TOTAL 318.39

FLOATING ROOF TANKS

TANK ID NO. BT-201

Modification - Appl. 0220-08 - Throughput Increase

ROOF TYPE (INTERNAL, EXTERNAL) = INTERNAL

CAPACITY (bbl)= **35,000** CAPACITY (gal)= 1,470,000
 TANK DIAMETER (ft)= **65** FUEL TYPE= **UNLEADED PREM**
 TANK HEIGHT (ft)= **60** VMW (lb/lb-mole)= **64**
 LIQUID HEIGHT (ft)= 59.22 DISTILLATION SLOPE= **3**
 THROUGHPUT (bbl/yr)= 296,450 RVP= **11.500**
 TURNOVERS= **8.47**

PAINT ABSORPTANCE= **0.170**
 INSULATION FACTOR= **1.639**
 AVG. WIND SPEED (TABLE 7.1-9, PG. 7.1-74)= **11.40**

$$L_T = L_R + L_{WD} + L_F + L_D = \mathbf{9,775 \text{ lbs}}$$

$$L_R = \text{rim seal loss} = (K_{Ra} - K_{Rb}v^n)DP \cdot M_v K_C = 5280$$

$$K_{Ra} \text{ (table 7.1-8, pg. 7.1-73)} = \mathbf{5.8}$$

$$K_{Rb} \text{ (table 7.1-8, pg. 7.1-73)} = \mathbf{0.3}$$

$$n \text{ (table 7.1-8, pg. 7.1-73)} = \mathbf{2.1}$$

$$v \text{ (note 1, pg. 7.1-21)} = 0$$

$$P^* \text{ (vapor pres. function)} = 0.219$$

$$K_C \text{ (page 7.1-21)} = 1.00$$

$$L_{WD} = \text{withdrawal loss} = \{(0.943QCW_L)/D\}[1 + (N_C F_C/D)] = 37$$

$$C \text{ (table 7.1-10, pg. 7.1-78)} = \mathbf{0.0015}$$

$$W_L \text{ (tables 7.1-2 \& 3, pg. 7.1-53)} = \mathbf{5.60}$$

$$N_C \text{ (note 2, pg. 7.1-22)} = \mathbf{1}$$

$$F_C \text{ (note 3, pg. 7.1-21)} = \mathbf{1}$$

$$L_F = \text{deck fitting loss} = F_F P^* M_v K_C = 4459$$

$$F_F \text{ (table 7.1-12)} = 318.39$$

$$L_D = \text{deck seam loss} = K_D S_D D^2 P^* M_v K_C = 0$$

$$K_D \text{ (0 for welded, else 0.14 pg. 7.1-24)} = \mathbf{0.00}$$

$$\text{Total length of deck seam (ft)} = \mathbf{150}$$

$$S_D \text{ (pg. 7.1-25)} = 0.000$$

$$L_T = \mathbf{4.9 \text{ T/yr}}$$

HAPS	VAPOR WEIGHT		EMISSIONS (lb/yr)
	CAS #	FACTOR	
BENZENE	71432	0.0104	101.66
HEXANE	110543	0.0037	36.17
o-XYLENE	101414	0.0013	12.71
ETHYLBENZENE	95476	0.0013	12.71
p-XYLENE	106423	0.0016	15.64
m-XYLENE	108383	0.0046	44.97
TOLUENE	108883	0.0213	208.21
CUMENE	98828	0.0000	0.00

TOTAL HAPs (lb/yr) 432.1

TOTAL HAPs (TPY) 0.22

P_{VA}= 8.661
 T_{LA}= 539.162

A= 11.7
 B= 5,134
 T_{AA}= 536.95
 T_B= 536.97

DECK FITTING LOSS	QTY	K _F
<u>Access hatch (24" dia.)</u>		
bolted cover, gasket		0.00
unbolted cover, gasket		0.00
unbolted cover, no gasket	1	36.00
<u>Fixed roof support column well</u>		
Round pipe, ungasketed sliding cover		0.00
Round pipe, gasketed sliding cover		0.00
Round pipe, flex fabric sleeve seal	1	10.00
Built-up col., ungasketed sliding cover		0.00
Built-up col., gasketed sliding cover		0.00
<u>Unslotted guide-pole and well</u>		
Ungasketed sliding cover		0.00
Ungasketed sliding cover w/ pole sleeve		0.00
Gasketed sliding cover		0.00
Gasketed sliding cover w/pole wiper		0.00
Gasketed sliding cover w/pole sleeve		0.00
<u>Slotted guide-pole/sample well</u>		
Ungasketed or gasketed sliding cover		0.00
Ungasketed or gasketed sliding cover w/float		0.00
Gasketed sliding cover w/pole wiper		0.00
Gasketed sliding cover w/pole sleeve		0.00
Gasketed sliding cover w/float & pole wiper		0.00
Gasketed sliding cover w/float, wiper & sleeve		0.00
<u>Automatic gauge float well</u>		
unbolted cover, ungasketed	1	14.00
unbolted cover, gasket		0.00
bolted cover, gasket		0.00

DECK FITTING LOSS	QTY	K _F
<u>Gauge-hatch/sample port</u>		
Weighted mechanical, gasket		0.00
Weighted mechanical, ungasket		0.00
Slit fabric seal, 10% open area	1	12.00
<u>Vacuum breaker</u>		
Weighted mechanical, ungasketed		0.00
Weighted mechanical, gasketed		0.00
<u>Deck drain (3" dia.)</u>		
Open		0.00
90% closed		0.00
<u>Stub drain</u>	29	34.56
<u>Deck leg</u>		
Adjustable, internal floating	17	134.30
Adjustable, pontoon area, ungasketed		0.00
Adjustable, pontoon area, gasketed		0.00
Adjustable, pontoon area, sock		0.00
Adjustable, center area, ungasketed	1	0.82
Adjustable, center area, gasketed		0.00
Adjustable, center area, sock		0.00
Adjustable, double deck roofs		0.00
<u>Rim vent</u>		
Weighted mechanical, ungasketed		0.00
Weighted mechanical, gasketed	1	0.71
<u>Ladder well</u>		
Sliding cover, ungasketed	1	76.00
Sliding cover, gasketed		0.00
TOTAL		318.39

FLOATING ROOF TANKS

TANK ID NO. BT-202

Modification - Appl. 0220-08 - Throughput Increase

ROOF TYPE (INTERNAL, EXTERNAL) = INTERNAL

CAPACITY (bbl)= **60,000** CAPACITY (gal)= 2,520,000
 TANK DIAMETER (ft)= **85** FUEL TYPE= **UNLEADED PREM**
 TANK HEIGHT (ft)= **60** VMW (lb/lb-mole)= **64**
 LIQUID HEIGHT (ft)= 59.36 DISTILLATION SLOPE= **3**
 THROUGHPUT (bbl/yr)= 508,200 RVP= **11.500**
 TURNOVERS= **8.47**

PAINT ABSORPTANCE= **0.170**
 INSULATION FACTOR= **1.639**
 AVG. WIND SPEED (TABLE 7.1-9, PG. 7.1-74)= **11.40**

$$L_T = L_R + L_{WD} + L_F + L_D = \mathbf{11,411 \text{ lbs}}$$

$$L_R = \text{rim seal loss} = (K_{Ra} - K_{Rb}v^n)DP \cdot M_v K_C = 6904$$

$$K_{Ra} \text{ (table 7.1-8, pg. 7.1-73)} = \mathbf{5.8}$$

$$K_{Rb} \text{ (table 7.1-8, pg. 7.1-73)} = \mathbf{0.3}$$

$$n \text{ (table 7.1-8, pg. 7.1-73)} = \mathbf{2.1}$$

$$v \text{ (note 1, pg. 7.1-21)} = 0$$

$$P^* \text{ (vapor pres. function)} = 0.219$$

$$K_C \text{ (page 7.1-21)} = 1.00$$

$$L_{WD} = \text{withdrawal loss} = \{(0.943QCW_L)/D\}[1 + (N_C F_C/D)] = 48$$

$$C \text{ (table 7.1-10, pg. 7.1-78)} = \mathbf{0.0015}$$

$$W_L \text{ (tables 7.1-2 \& 3, pg. 7.1-53)} = \mathbf{5.60}$$

$$N_C \text{ (note 2, pg. 7.1-22)} = \mathbf{1}$$

$$F_C \text{ (note 3, pg. 7.1-21)} = \mathbf{1}$$

$$L_F = \text{deck fitting loss} = F_F P^* M_v K_C = 4459$$

$$F_F \text{ (table 7.1-12)} = 318.39$$

$$L_D = \text{deck seam loss} = K_D S_D D^2 P^* M_v K_C = 0$$

$$K_D \text{ (0 for welded, else 0.14 pg. 7.1-24)} = \mathbf{0.00}$$

$$\text{Total length of deck seam (ft)} = \mathbf{150}$$

$$S_D \text{ (pg. 7.1-25)} = 0.000$$

$$L_T = \mathbf{5.7 \text{ T/yr}}$$

HAPS	VAPOR WEIGHT		EMISSIONS (lb/yr)
	CAS #	FACTOR	
BENZENE	71432	0.0104	118.67
HEXANE	110543	0.0037	42.22
o-XYLENE	101414	0.0013	14.83
ETHYLBENZENE	95476	0.0013	14.83
p-XYLENE	106423	0.0016	18.26
m-XYLENE	108383	0.0046	52.49
TOLUENE	108883	0.0213	243.05
CUMENE	98828	0.0000	0.00

TOTAL HAPs (lb/yr) 504.4

TOTAL HAPs (TPY) 0.25

P_{VA}= 8.661
 T_{LA}= 539.162

A= 11.7
 B= 5,134
 T_{AA}= 536.95
 T_B= 536.97

DECK FITTING LOSS	QTY	K _F
<u>Access hatch (24" dia)</u>		
bolted cover, gasket		0.00
unbolted cover, gasket		0.00
unbolted cover, no gasket	1	36.00
<u>Fixed roof support column well</u>		
Round pipe, ungasketed sliding cover		0.00
Round pipe, gasketed sliding cover		0.00
Round pipe, flex fabric sleeve seal	1	10.00
Built-up col., ungasketed sliding cover		0.00
Built-up col., gasketed sliding cover		0.00
<u>Unslotted guide-pole and well</u>		
Ungasketed sliding cover		0.00
Ungasketed sliding cover w/ pole sleeve		0.00
Gasketed sliding cover		0.00
Gasketed sliding cover w/pole wiper		0.00
Gasketed sliding cover w/pole sleeve		0.00
<u>Slotted guide-pole/sample well</u>		
Ungasketed or gasketed sliding cover		0.00
Ungasketed or gasketed sliding cover w/float		0.00
Gasketed sliding cover w/pole wiper		0.00
Gasketed sliding cover w/pole sleeve		0.00
Gasketed sliding cover w/float & pole wiper		0.00
Gasketed sliding cover w/float, wiper & sleeve		0.00
<u>Automatic gauge float well</u>		
unbolted cover, ungasketed	1	14.00
unbolted cover, gasket		0.00
bolted cover, gasket		0.00

DECK FITTING LOSS	QTY	K _F
<u>Gauge-hatch/sample port</u>		
Weighted mechanical, gasket		0.00
Weighted mechanical, ungasket		0.00
Slit fabric seal, 10% open area	1	12.00
<u>Vacuum breaker</u>		
Weighted mechanical, ungasketed		0.00
Weighted mechanical, gasketed		0.00
<u>Deck drain (3" dia.)</u>		
Open		0.00
90% closed		0.00
<u>Stub drain</u>	29	34.56
<u>Deck leg</u>		
Adjustable, internal floating	17	134.30
Adjustable, pontoon area, ungasketed		0.00
Adjustable, pontoon area, gasketed		0.00
Adjustable, pontoon area, sock		0.00
Adjustable, center area, ungasketed	1	0.82
Adjustable, center area, gasketed		0.00
Adjustable, center area, sock		0.00
Adjustable, double deck roofs		0.00
<u>Rim vent</u>		
Weighted mechanical, ungasketed		0.00
Weighted mechanical, gasketed	1	0.71
<u>Ladder well</u>		
Sliding cover, ungasketed	1	76.00
Sliding cover, gasketed		0.00
TOTAL		318.39

FLOATING ROOF TANKS

TANK ID NO. BT-203

Modification - Appl. 0220-08 - Throughput Increase

ROOF TYPE (INTERNAL, EXTERNAL) = INTERNAL

CAPACITY (bbl)= **68,000** CAPACITY (gal)= 2,856,000
 TANK DIAMETER (ft)= **92** FUEL TYPE= **UNLEADED PREM**
 TANK HEIGHT (ft)= **60** VMW (lb/lb-mole)= **64**
 LIQUID HEIGHT (ft)= 57.43 DISTILLATION SLOPE= **3**
 THROUGHPUT (bbl/yr)= 575,960 RVP= **11.500**
 TURNSOVERS= **8.47**

PAINT ABSORPTANCE= **0.170**
 INSULATION FACTOR= **1.639**
 AVG. WIND SPEED (TABLE 7.1-9, PG. 7.1-74)= **11.40**

$$L_T = L_R + L_{WD} + L_F + L_D = 17,009 \text{ lbs}$$

$$L_R = \text{rim seal loss} = (K_{Ra} - K_{Rb}v^n)DP \cdot M_v K_C = 7473$$

$$K_{Ra} \text{ (table 7.1-8, pg. 7.1-73)} = 5.8$$

$$K_{Rb} \text{ (table 7.1-8, pg. 7.1-73)} = 0.3$$

$$n \text{ (table 7.1-8, pg. 7.1-73)} = 2.1$$

$$v \text{ (note 1, pg. 7.1-21)} = 0$$

$$P^* \text{ (vapor pres. function)} = 0.219$$

$$K_C \text{ (page 7.1-21)} = 1.00$$

$$L_{WD} = \text{withdrawal loss} = \{(0.943QCW_L)/D\}[1 + (N_C F_C/D)] = 50$$

$$C \text{ (table 7.1-10, pg. 7.1-78)} = 0.0015$$

$$W_L \text{ (tables 7.1-2 \& 3, pg. 7.1-53)} = 5.60$$

$$N_C \text{ (note 2, pg. 7.1-22)} = 1$$

$$F_C \text{ (note 3, pg. 7.1-21)} = 1$$

$$L_F = \text{deck fitting loss} = F_F P^* M_v K_C = 9486$$

$$F_F \text{ (table 7.1-12)} = 677.39$$

$$L_D = \text{deck seam loss} = K_D S_D D^2 P^* M_v K_C = 0$$

$$K_D \text{ (0 for welded, else 0.14 pg. 7.1-24)} = 0.00$$

$$\text{Total length of deck seam (ft)} = 150$$

$$S_D \text{ (pg. 7.1-25)} = 0.000$$

$$L_T = 8.5 \text{ T/yr}$$

HAPS	CAS #	VAPOR WEIGHT	EMISSIONS
		FACTOR	(lb/yr)
BENZENE	71432	0.0104	176.90
HEXANE	110543	0.0037	62.93
o-XYLENE	101414	0.0013	22.11
ETHYLBENZENE	95476	0.0013	22.11
p-XYLENE	106423	0.0016	27.21
m-XYLENE	108383	0.0046	78.24
TOLUENE	108883	0.0213	362.29
CUMENE	98828	0.0000	0.00

TOTAL HAPs (lb/yr) 751.8

TOTAL HAPs (TPY) 0.38

$P_{VA} = 8.661$
 $T_{LA} = 539.162$
 $A = 11.7$
 $B = 5,134$
 $T_{AA} = 536.95$
 $T_B = 536.97$

DECK FITTING LOSS	QTY	K _F
<u>Access hatch (24" dia)</u>		
bolted cover, gasket		0.00
unbolted cover, gasket		0.00
unbolted cover, no gasket	1	36.00
<u>Fixed roof support column well</u>		
Round pipe, ungasketed sliding cover		0.00
Round pipe, gasketed sliding cover		0.00
Round pipe, flex fabric sleeve seal	1	10.00
Built-up col., ungasketed sliding cover		0.00
Built-up col., gasketed sliding cover		0.00
<u>Unslotted guide-pole and well</u>		
Ungasketed sliding cover		0.00
Ungasketed sliding cover w/ pole sleeve		0.00
Gasketed sliding cover		0.00
Gasketed sliding cover w/pole wiper		0.00
Gasketed sliding cover w/pole sleeve		0.00
<u>Slotted guide-pole/sample well</u>		
Ungasketed or gasketed sliding cover	6	258.00
Ungasketed or gasketed sliding cover w/float		0.00
Gasketed sliding cover w/pole wiper		0.00
Gasketed sliding cover w/pole sleeve		0.00
Gasketed sliding cover w/float & pole wiper		0.00
Gasketed sliding cover w/float, wiper & sleeve		0.00
<u>Automatic gauge float well</u>		
unbolted cover, ungasketed	1	14.00
unbolted cover, gasket		0.00
bolted cover, gasket		0.00

DECK FITTING LOSS	QTY	K _F
<u>Gauge-hatch/sample port</u>		
Weighted mechanical, gasket		0.00
Weighted mechanical, ungasket		0.00
Slit fabric seal, 10% open area	1	12.00
<u>Vacuum breaker</u>		
Weighted mechanical, ungasketed		0.00
Weighted mechanical, gasketed	1	6.20
<u>Deck drain (3" dia.)</u>		
Open		0.00
90% closed		0.00
<u>Stub drain</u>	29	34.56
<u>Deck leg</u>		
Adjustable, internal floating	29	229.10
Adjustable, pontoon area, ungasketed		0.00
Adjustable, pontoon area, gasketed		0.00
Adjustable, pontoon area, sock		0.00
Adjustable, center area, ungasketed	1	0.82
Adjustable, center area, gasketed		0.00
Adjustable, center area, sock		0.00
Adjustable, double deck roofs		0.00
<u>Rim vent</u>		
Weighted mechanical, ungasketed		0.00
Weighted mechanical, gasketed	1	0.71
<u>Ladder well</u>		
Sliding cover, ungasketed	1	76.00
Sliding cover, gasketed		0.00
TOTAL		677.39

FLOATING ROOF TANKS

TANK ID NO. BT-204

Modification - Appl. 0220-08 - Throughput Increase

ROOF TYPE (INTERNAL, EXTERNAL) = INTERNAL

CAPACITY (bbl)= **68,000** CAPACITY (gal)= 2,856,000
 TANK DIAMETER (ft)= **92** FUEL TYPE= **UNLEADED PREM**
 TANK HEIGHT (ft)= **60** VMW (lb/lb-mole)= **64**
 LIQUID HEIGHT (ft)= 57.43 DISTILLATION SLOPE= **3**
 THROUGHPUT (bbl/yr)= 575,960 RVP= **11.500**
 TURNOVERS= **8.47**

PAINT ABSORPTANCE= **0.170**
 INSULATION FACTOR= **1.639**
 AVG. WIND SPEED (TABLE 7.1-9, PG. 7.1-74)= **11.40**

$$L_T = L_R + L_{WD} + L_F + L_D = 17,009 \text{ lbs}$$

$$L_R = \text{rim seal loss} = (K_{Ra} - K_{Rb}v^n)DP \cdot M_v K_C = 7473$$

$$K_{Ra} \text{ (table 7.1-8, pg. 7.1-73)} = 5.8$$

$$K_{Rb} \text{ (table 7.1-8, pg. 7.1-73)} = 0.3$$

$$n \text{ (table 7.1-8, pg. 7.1-73)} = 2.1$$

$$v \text{ (note 1, pg. 7.1-21)} = 0$$

$$P^* \text{ (vapor pres. function)} = 0.219$$

$$K_C \text{ (page 7.1-21)} = 1.00$$

$$L_{WD} = \text{withdrawal loss} = \{(0.943QCW_L)/D\}[1 + (N_C F_C/D)] = 50$$

$$C \text{ (table 7.1-10, pg. 7.1-78)} = 0.0015$$

$$W_L \text{ (tables 7.1-2 \& 3, pg. 7.1-53)} = 5.60$$

$$N_C \text{ (note 2, pg. 7.1-22)} = 1$$

$$F_C \text{ (note 3, pg. 7.1-21)} = 1$$

$$L_F = \text{deck fitting loss} = F_F P^* M_v K_C = 9486$$

$$F_F \text{ (table 7.1-12)} = 677.39$$

$$L_D = \text{deck seam loss} = K_D S_D D^2 P^* M_v K_C = 0$$

$$K_D \text{ (0 for welded, else 0.14 pg. 7.1-24)} = 0.00$$

$$\text{Total length of deck seam (ft)} = 150$$

$$S_D \text{ (pg. 7.1-25)} = 0.000$$

$$L_T = 8.5 \text{ T/yr}$$

HAPS	CAS #	VAPOR WEIGHT	EMISSIONS
		FACTOR	(lb/yr)
BENZENE	71432	0.0104	176.90
HEXANE	110543	0.0037	62.93
o-XYLENE	101414	0.0013	22.11
ETHYLBENZENE	95476	0.0013	22.11
p-XYLENE	106423	0.0016	27.21
m-XYLENE	108383	0.0046	78.24
TOLUENE	108883	0.0213	362.29
CUMENE	98828	0.0000	0.00

TOTAL HAPs (lb/yr) 751.8

TOTAL HAPs (TPY) 0.38

$P_{VA} = 8.661$
 $T_{LA} = 539.162$

$A = 11.7$
 $B = 5,134$
 $T_{AA} = 536.95$
 $T_B = 536.97$

DECK FITTING LOSS	QTY	K _F
<u>Access hatch (24" dia)</u>		
bolted cover, gasket		0.00
unbolted cover, gasket		0.00
unbolted cover, no gasket	1	36.00
<u>Fixed roof support column well</u>		
Round pipe, ungasketed sliding cover		0.00
Round pipe, gasketed sliding cover		0.00
Round pipe, flex fabric sleeve seal	1	10.00
Built-up col., ungasketed sliding cover		0.00
Built-up col., gasketed sliding cover		0.00
<u>Unslotted guide-pole and well</u>		
Ungasketed sliding cover		0.00
Ungasketed sliding cover w/ pole sleeve		0.00
Gasketed sliding cover		0.00
Gasketed sliding cover w/pole wiper		0.00
Gasketed sliding cover w/pole sleeve		0.00
<u>Slotted guide-pole/sample well</u>		
Ungasketed or gasketed sliding cover	6	258.00
Ungasketed or gasketed sliding cover w/float		0.00
Gasketed sliding cover w/pole wiper		0.00
Gasketed sliding cover w/pole sleeve		0.00
Gasketed sliding cover w/float & pole wiper		0.00
Gasketed sliding cover w/float, wiper & sleeve		0.00
<u>Automatic gauge float well</u>		
unbolted cover, ungasketed	1	14.00
unbolted cover, gasket		0.00
bolted cover, gasket		0.00

DECK FITTING LOSS	QTY	K _F
<u>Gauge-hatch/sample port</u>		
Weighted mechanical, gasket		0.00
Weighted mechanical, ungasket		0.00
Slit fabric seal, 10% open area	1	12.00
<u>Vacuum breaker</u>		
Weighted mechanical, ungasketed		0.00
Weighted mechanical, gasketed	1	6.20
<u>Deck drain (3" dia.)</u>		
Open		0.00
90% closed		0.00
<u>Stub drain</u>	29	34.56
<u>Deck leg</u>		
Adjustable, internal floating	29	229.10
Adjustable, pontoon area, ungasketed		0.00
Adjustable, pontoon area, gasketed		0.00
Adjustable, pontoon area, sock		0.00
Adjustable, center area, ungasketed	1	0.82
Adjustable, center area, gasketed		0.00
Adjustable, center area, sock		0.00
Adjustable, double deck roofs		0.00
<u>Rim vent</u>		
Weighted mechanical, ungasketed		0.00
Weighted mechanical, gasketed	1	0.71
<u>Ladder well</u>		
Sliding cover, ungasketed	1	76.00
Sliding cover, gasketed		0.00
TOTAL		677.39

FLOATING ROOF TANKS

TANK ID NO. BT-205

Modification - Appl. 0220-08 - Throughput Increase

ROOF TYPE (INTERNAL, EXTERNAL) = INTERNAL

CAPACITY (bbl)= **50,000** CAPACITY (gal)= 2,100,000
 TANK DIAMETER (ft)= **79** FUEL TYPE= **UNLEADED PREM**
 TANK HEIGHT (ft)= **60** VMW (lb/lb-mole)= **64**
 LIQUID HEIGHT (ft)= 57.27 DISTILLATION SLOPE= **3**
 THROUGHPUT (bbl/yr)= 423,500 RVP= **11.500**
 TURNSOVERS= **8.47**

PAINT ABSORPTANCE= **0.170**
 INSULATION FACTOR= **1.639**
 AVG. WIND SPEED (TABLE 7.1-9, PG. 7.1-74)= **11.40**

$$L_T = L_R + L_{WD} + L_F + L_D = \mathbf{10,919 \text{ lbs}}$$

$$L_R = \text{rim seal loss} = (K_{Ra} - K_{Rb}v^n)DP \cdot M_v K_C = 6417$$

$$K_{Ra} \text{ (table 7.1-8, pg. 7.1-73)} = \mathbf{5.8}$$

$$K_{Rb} \text{ (table 7.1-8, pg. 7.1-73)} = \mathbf{0.3}$$

$$n \text{ (table 7.1-8, pg. 7.1-73)} = \mathbf{2.1}$$

$$v \text{ (note 1, pg. 7.1-21)} = 0$$

$$P^* \text{ (vapor pres. function)} = 0.219$$

$$K_C \text{ (page 7.1-21)} = 1.00$$

$$L_{WD} = \text{withdrawal loss} = \{(0.943QCW_L)/D\}[1 + (N_C F_C/D)] = 43$$

$$C \text{ (table 7.1-10, pg. 7.1-78)} = \mathbf{0.0015}$$

$$W_L \text{ (tables 7.1-2 \& 3, pg. 7.1-53)} = \mathbf{5.60}$$

$$N_C \text{ (note 2, pg. 7.1-22)} = \mathbf{1}$$

$$F_C \text{ (note 3, pg. 7.1-21)} = \mathbf{1}$$

$$L_F = \text{deck fitting loss} = F_F P^* M_v K_C = 4459$$

$$F_F \text{ (table 7.1-12)} = 318.39$$

$$L_D = \text{deck seam loss} = K_D S_D D^2 P^* M_v K_C = 0$$

$$K_D \text{ (0 for welded, else 0.14 pg. 7.1-24)} = \mathbf{0.00}$$

$$\text{Total length of deck seam (ft)} = \mathbf{150}$$

$$S_D \text{ (pg. 7.1-25)} = 0.000$$

$$L_T = \mathbf{5.5 \text{ T/yr}}$$

HAPS	CAS #	VAPOR WEIGHT	EMISSIONS
		FACTOR	(lb/yr)
BENZENE	71432	0.0104	113.55
HEXANE	110543	0.0037	40.40
o-XYLENE	101414	0.0013	14.19
ETHYLBENZENE	95476	0.0013	14.19
p-XYLENE	106423	0.0016	17.47
m-XYLENE	108383	0.0046	50.23
TOLUENE	108883	0.0213	232.57
CUMENE	98828	0.0000	0.00

TOTAL HAPs (lb/yr) 482.6

TOTAL HAPs (TPY) 0.24

P_{VA}= 8.661
 T_{LA}= 539.162

A= 11.7
 B= 5,134
 T_{AA}= 536.95
 T_B= 536.97

DECK FITTING LOSS	QTY	K _F
<u>Access hatch (24" dia)</u>		
bolted cover, gasket		0.00
unbolted cover, gasket		0.00
unbolted cover, no gasket	1	36.00
<u>Fixed roof support column well</u>		
Round pipe, ungasketed sliding cover		0.00
Round pipe, gasketed sliding cover		0.00
Round pipe, flex fabric sleeve seal	1	10.00
Built-up col., ungasketed sliding cover		0.00
Built-up col., gasketed sliding cover		0.00
<u>Unslotted guide-pole and well</u>		
Ungasketed sliding cover		0.00
Ungasketed sliding cover w/ pole sleeve		0.00
Gasketed sliding cover		0.00
Gasketed sliding cover w/pole wiper		0.00
Gasketed sliding cover w/pole sleeve		0.00
<u>Slotted guide-pole/sample well</u>		
Ungasketed or gasketed sliding cover		0.00
Ungasketed or gasketed sliding cover w/float		0.00
Gasketed sliding cover w/pole wiper		0.00
Gasketed sliding cover w/pole sleeve		0.00
Gasketed sliding cover w/float & pole wiper		0.00
Gasketed sliding cover w/float, wiper & sleeve		0.00
<u>Automatic gauge float well</u>		
unbolted cover, ungasketed	1	14.00
unbolted cover, gasket		0.00
bolted cover, gasket		0.00

DECK FITTING LOSS	QTY	K _F
<u>Gauge-hatch/sample port</u>		
Weighted mechanical, gasket		0.00
Weighted mechanical, ungasket		0.00
Slit fabric seal, 10% open area	1	12.00
<u>Vacuum breaker</u>		
Weighted mechanical, ungasketed		0.00
Weighted mechanical, gasketed		0.00
<u>Deck drain (3" dia.)</u>		
Open		0.00
90% closed		0.00
<u>Stub drain</u>	29	34.56
<u>Deck leg</u>		
Adjustable, internal floating	17	134.30
Adjustable, pontoon area, ungasketed		0.00
Adjustable, pontoon area, gasketed		0.00
Adjustable, pontoon area, sock		0.00
Adjustable, center area, ungasketed	1	0.82
Adjustable, center area, gasketed		0.00
Adjustable, center area, sock		0.00
Adjustable, double deck roofs		0.00
<u>Rim vent</u>		
Weighted mechanical, ungasketed		0.00
Weighted mechanical, gasketed	1	0.71
<u>Ladder well</u>		
Sliding cover, ungasketed	1	76.00
Sliding cover, gasketed		0.00
TOTAL		318.39

FLOATING ROOF TANKS

TANK ID NO. BT-301

Modification - Appl. 0220-08 - Throughput Increase

ROOF TYPE (INTERNAL, EXTERNAL) = INTERNAL

CAPACITY (bbl)= **5,000** CAPACITY (gal)= 210,000
 TANK DIAMETER (ft)= **41** FUEL TYPE= **UNLEADED PREM**
 TANK HEIGHT (ft)= **24** VMW (lb/lb-mole)= **64**
 LIQUID HEIGHT (ft)= 21.26 DISTILLATION SLOPE= **3**
 THROUGHPUT (bbl/yr)= 15,000 RVP= **11.500**
 TURNSOVERS= **3.00**

PAINT ABSORPTANCE= **0.170**
 INSULATION FACTOR= **1.639**
 AVG. WIND SPEED (TABLE 7.1-9, PG. 7.1-74)= **11.40**

$$L_T = L_R + L_{WD} + L_F + L_D = \mathbf{6,430 \text{ lbs}}$$

$$L_R = \text{rim seal loss} = (K_{Ra} - K_{Rb}v^n)DP \cdot M_v K_C = 3330$$

$$K_{Ra} \text{ (table 7.1-8, pg. 7.1-73)} = \mathbf{5.8}$$

$$K_{Rb} \text{ (table 7.1-8, pg. 7.1-73)} = \mathbf{0.3}$$

$$n \text{ (table 7.1-8, pg. 7.1-73)} = \mathbf{2.1}$$

$$v \text{ (note 1, pg. 7.1-21)} = 0$$

$$P^* \text{ (vapor pres. function)} = 0.219$$

$$K_C \text{ (page 7.1-21)} = 1.00$$

$$L_{WD} = \text{withdrawal loss} = \{(0.943QCW_L)/D\} [1 + (N_C F_C/D)] = 3$$

$$C \text{ (table 7.1-10, pg. 7.1-78)} = \mathbf{0.0015}$$

$$W_L \text{ (tables 7.1-2 \& 3, pg. 7.1-53)} = \mathbf{5.60}$$

$$N_C \text{ (note 2, pg. 7.1-22)} = \mathbf{1}$$

$$F_C \text{ (note 3, pg. 7.1-21)} = \mathbf{1}$$

$$L_F = \text{deck fitting loss} = F_F P^* M_v K_C = 3096$$

$$F_F \text{ (table 7.1-12)} = 221.10$$

$$L_D = \text{deck seam loss} = K_D S_D D^2 P^* M_v K_C = 0$$

$$K_D \text{ (0 for welded, else 0.14 pg. 7.1-24)} = \mathbf{0.00}$$

$$\text{Total length of deck seam (ft)} = \mathbf{150}$$

$$S_D \text{ (pg. 7.1-25)} = 0.000$$

$$L_T = \mathbf{3.2 \text{ T/yr}}$$

HAPS	CAS #	VAPOR WEIGHT	EMISSIONS
		FACTOR	(lb/yr)
BENZENE	71432	0.0104	66.87
HEXANE	110543	0.0037	23.79
o-XYLENE	101414	0.0013	8.36
ETHYLBENZENE	95476	0.0013	8.36
p-XYLENE	106423	0.0016	10.29
m-XYLENE	108383	0.0046	29.58
TOLUENE	108883	0.0213	136.95
CUMENE	98828	0.0000	0.00

TOTAL HAPs (lb/yr) 284.2

TOTAL HAPs (TPY) 0.14

P_{VA}= 8.661
 T_{LA}= 539.162

A= 11.7
 B= 5,134
 T_{AA}= 536.95
 T_B= 536.97

DECK FITTING LOSS	QTY	K _F
<u>Access hatch (24" dia)</u>		
bolted cover, gasket		0.00
unbolted cover, gasket		0.00
unbolted cover, no gasket	1	36.00
<u>Fixed roof support column well</u>		
Round pipe, ungasketed sliding cover		0.00
Round pipe, gasketed sliding cover		0.00
Round pipe, flex fabric sleeve seal	1	10.00
Built-up col., ungasketed sliding cover		0.00
Built-up col., gasketed sliding cover		0.00
<u>Unslotted guide-pole and well</u>		
Ungasketed sliding cover		0.00
Ungasketed sliding cover w/ pole sleeve		0.00
Gasketed sliding cover		0.00
Gasketed sliding cover w/pole wiper		0.00
Gasketed sliding cover w/pole sleeve		0.00
<u>Slotted guide-pole/sample well</u>		
Ungasketed or gasketed sliding cover		0.00
Ungasketed or gasketed sliding cover w/float		0.00
Gasketed sliding cover w/pole wiper		0.00
Gasketed sliding cover w/pole sleeve		0.00
Gasketed sliding cover w/float & pole wiper		0.00
Gasketed sliding cover w/float, wiper & sleeve		0.00
<u>Automatic gauge float well</u>		
unbolted cover, ungasketed	1	14.00
unbolted cover, gasket		0.00
bolted cover, gasket		0.00

DECK FITTING LOSS	QTY	K _F
<u>Gauge-hatch/sample port</u>		
Weighted mechanical, gasket		0.00
Weighted mechanical, ungasket		0.00
Slit fabric seal, 10% open area	1	12.00
<u>Vacuum breaker</u>		
Weighted mechanical, ungasketed		0.00
Weighted mechanical, gasketed		0.00
<u>Deck drain (3" dia.)</u>		
Open		0.00
90% closed		0.00
<u>Stub drain</u>	5	5.53
<u>Deck leg</u>		
Adjustable, internal floating	8	66.04
Adjustable, pontoon area, ungasketed		0.00
Adjustable, pontoon area, gasketed		0.00
Adjustable, pontoon area, sock		0.00
Adjustable, center area, ungasketed	1	0.82
Adjustable, center area, gasketed		0.00
Adjustable, center area, sock		0.00
Adjustable, double deck roofs		0.00
<u>Rim vent</u>		
Weighted mechanical, ungasketed		0.00
Weighted mechanical, gasketed	1	0.71
<u>Ladder well</u>		
Sliding cover, ungasketed	1	76.00
Sliding cover, gasketed		0.00
TOTAL		221.10

LOAD RACK WITH VAPOR RECOVERY UNIT

Modification - Appl. 0220-08 - Throughput Increase

MAX EMISSION FROM VAPOR RECOVERY UNIT = 10 mg/l
 10mg/l(11/0.2642 gal)(1g/1000 mg)(1 lb/453.5924g) = 8.34E-05 lb/gal

NUMBER OF LOAD STATIONS= 2 FLOW RATE AT ARM= 900 GPM
 NUMBER OF ARMS PER STATION= 5 POTENTIAL MAX= 9,000 GPM
 TOTAL LOAD ARMS = 10 POTENTIAL MAX= 4.73E+09 GPY
 MAX FLOW RATE= 500,000 GPD
 MAX FLOW RATE= 1.83E+08 GPY
 PROPOSED FLOW = 1.81E+08 GPY

POTENTIAL EMISSIONS= 197.4 TPY
 MAX EMISSIONS= 7.6 TPY
 PROPOSED EMISSIONS= 7.55 TPY

The maximum flow rate was calculated using the design maximum of the pump. Although the vapor recovery unit is not designed to handle this much flow, the maximum flow rate of the pump was used to calculate the maximum potential emissions.

PROPOSED THROUGHPUT =	181,000,000 gal/yr	%	MAX FLOW 1.83E+08	EMISSIONS MAX (T/yr)	PROPOSED (T/yr)
UNLEADED REG =	181,000,000 gal/yr	100.0%	1.83E+08	7.61	7.55
UNLEADED PRE=	gal/yr	0.0%	0.00E+00	-	-
HI S DIESEL #2 =	gal/yr	0.0%	0.00E+00	-	-
LO S DIESEL #2 =	gal/yr	0.0%	0.00E+00	-	-
TOTAL				7.6	7.6

MAX FLOW HAPS	CAS #	UNLEADED REG VWF	(T/yr)	UNLEADED PREM VWF	(T/yr)	HI S DIESEL #2 VWF	(T/yr)	LO S DIESEL #2 VWF	(T/yr)	TOTAL (T/yr)
BENZENE	71432	0.0041	0.03	0.0030	-	0.2261	-	0.2261	-	0.03
NAPHTHALENE	91203	0.0000	-	0.0000	-	0.0000	-	0.0000	-	-
o-XYLENE	101414	0.0006	0.00	0.0003	-	0.0000	-	0.0000	-	0.00
ETHYLBENZENE	95476	0.0006	0.00	0.0003	-	0.0000	-	0.0000	-	0.00
p-XYLENE	106423	0.0008	0.01	0.0080	-	0.0000	-	0.0000	-	0.01
m-XYLENE	108383	0.0010	0.01	0.0011	-	0.0000	-	0.0000	-	0.01
TOLUENE	108883	0.0064	0.05	0.0065	-	0.0000	-	0.0000	-	0.05
CUMENE	98828	0.0000	-	0.0000	-	0.0118	-	0.0118	-	-
TOTAL (lb/yr)		0.10	-	-	-	-	-	-	-	0.10

PROPOSED HAPS	CAS #	UNLEADED REG VWF	(T/yr)	UNLEADED PREM VWF	(T/yr)	HI S DIESEL #2 VWF	(T/yr)	LO S DIESEL #2 VWF	(T/yr)	TOTAL (T/yr)
BENZENE	71432	0.0041	0.03	0.0030	0.00	0.2261	0.00	0.2261	0.00	0.03
NAPHTHALENE	91203	0.0000	0.00	0.0000	0.00	0.0000	0.00	0.0000	0.00	-
o-XYLENE	101414	0.0006	0.00	0.0003	0.00	0.0000	0.00	0.0000	0.00	0.00
ETHYLBENZENE	95476	0.0006	0.00	0.0003	0.00	0.0000	0.00	0.0000	0.00	0.00
p-XYLENE	106423	0.0008	0.01	0.0080	0.00	0.0000	0.00	0.0000	0.00	0.01
m-XYLENE	108383	0.0010	0.01	0.0011	0.00	0.0000	0.00	0.0000	0.00	0.01
TOLUENE	108883	0.0064	0.05	0.0065	0.00	0.0000	0.00	0.0000	0.00	0.05
CUMENE	98828	0.0000	0.00	0.0000	0.00	0.0118	0.00	0.0118	0.00	-
TOTAL (lb/yr)		0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10

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FUGITIVES

Modification - Appl. 0220-08 - Throughput Increase

SALES TERMINAL

OPERATING HOURS= 8,760 hours per year

FUGITIVE TYPE	VOC STATE	QUANTITY	EF (lb/hr)	EMISSIONS	
				(lb/yr)	(T/yr)
FITTINGS	GAS	76	4.20E-05	28.0	0.01
FITTINGS	LIQUID	2,370	8.00E-06	166.1	0.08
PUMPS	GAS	22	6.50E-05	12.5	0.01
PUMPS	LIQUID	22	5.40E-04	104.1	0.05
VALVES	GAS	25	1.30E-05	2.8	0.00
VALVES	LIQUID	520	4.30E-05	195.9	0.10
OTHERS	GAS	11	1.20E-04	11.6	0.01
OTHERS	LIQUID	153	1.30E-04	174.2	0.09
TOTAL				695	0.3

HAPS	CAS #	VAPOR WEIGHT FRACTION	EMISSIONS	
			(lb/yr)	(T/yr)
BENZENE	71432	0.0041	2.9	0.001
NAPHTHALENE	91203	0.0000	0.0	0.000
o-XYLENE	101414	0.0006	0.4	0.000
ETHYLBENZENE	95476	0.0006	0.4	0.000
p-XYLENE	106423	0.0008	0.6	0.000
m-XYLENE	108383	0.0010	0.7	0.000
TOLUENE	108883	0.0064	4.4	0.002
CUMENE	98828	0.0000	0.0	0.000
TOTAL			9	0.00

PIPELINE

OPERATING HOURS= 8,760 hours per year

FUGITIVE TYPE	VOC STATE	QUANTITY	EF (lb/hr)	EMISSIONS	
				(lb/yr)	(T/yr)
FITTINGS	GAS	-	0.0001	0.0	0.00
FITTINGS	LIQUID	66	0.0000	9.9	0.00
PUMPS	LIQUID	-	0.0012	0.0	0.00
VALVES	GAS	-	0.0000	0.0	0.00
VALVES	LIQUID	12	0.0001	10.0	0.00
OTHERS	GAS	-	0.0003	0.0	0.00
OTHERS	LIQUID	3	0.0003	7.5	0.00
TOTAL				27	0.0

HAPS	CAS #	VAPOR WEIGHT FRACTION	EMISSIONS	
			(lb/yr)	(T/yr)
BENZENE	71432	0.0041	0.1	0.000
NAPHTHALENE	91203	0.0000	0.0	0.000
o-XYLENE	101414	0.0006	0.0	0.000
ETHYLBENZENE	95476	0.0006	0.0	0.000
p-XYLENE	106423	0.0008	0.0	0.000
m-XYLENE	108383	0.0010	0.0	0.000
TOLUENE	108883	0.0064	0.2	0.000
CUMENE	98828	0.0000	0.0	0.000
TOTAL			0.4	0.00